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(54) AN OBJECT OF SYNTHETIC MATERIAL AND METHOD OF  
 MOULDING SAME

(71) We, ETABLISSEMENTS BERTRAND FAURE, a French Company of 20 rue Hoche, 92 Puteaux, France, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention concerns an object of synthetic material and a method of moulding such an object. The invention is particularly concerned with objects of the type having at least one reinforcing element embedded in the synthetic material and provided with mounting members which project from said object and are intended to secure it on a support.

In the known moulding methods, the reinforcing elements are generally rigid, and the positioning of them in a mould by means of the mounting members poses numerous problems. To position the elements, outwardly projecting portions of the mounting members are introduced into recessed holes formed either in the cover of the mould or in a supporting element integral with the cover.

However, it frequently happens that the mounting members are not precisely aligned with the corresponding recessed holes, and it becomes difficult to introduce them into the holes because of the rigidity of the reinforcing elements. Furthermore, these methods do not permit the reinforcing elements to be fitted perfectly against the mould cover or supporting element, and upward movement of the synthetic material may extend as far as the outwardly projecting portions of the mounting members. These portions of the material that have moved upwards interfere with the fixing of the moulded object on its support and therefore have to be trimmed off.

The present invention seeks to overcome these disadvantages and provides an object comprising a body of synthetic material, a reinforcing element of permeable elastically deformable material embedded in the body, the reinforcing element having a relatively denser zone formed by at least superficial penetration of the reinforcing element by the synthetic body material, and a plurality of mounting members extending through the reinforcing element, said mounting members each consisting of a rod, one end of which has a retaining surface adapted to bear on one face of the reinforcing element, and the other end of which projects from the object and is provided with means whereby the object may be secured to a support.

According to a further aspect of the invention, there is provided a method of moulding the above object said method comprising introducing the mounting members into the reinforcing element so that said other ends of the mounting members project therefrom, pressing the reinforcing element against the cover of a mould such that said other ends of said mounting members enter respective holes provided in the cover and are temporarily secured therein so that the reinforcing element is held tightly against the cover, pouring synthetic material into the mould, and closing the mould with said cover.

In the method of the invention, synthetic material is prevented from rising on to the outwardly projecting portions of the mounting members, since the reinforcing element can be firmly applied to the mould cover and can thus tightly seal the recessed holes. Furthermore, even if the mounting members are not in strict alignment with these recessed holes, the reinforcing element enables

this defect to be made good on account of its ability to deform.

The reinforcing element is made of a permeable elastically deformable material, for example an open-cell foamed material.

During its expansion stage, the synthetic material introduced into the mould is therefore able to adhere to the reinforcing element since it penetrates at least superficially into the open cells of the reinforcing element where it forms a relatively denser zone. This zone which surrounds the mounting members near their retaining surface, solidly bonds these members to the reinforcing element which in addition acquires great mechanical strength whereby it resists being pulled away. Advantageously, the reinforcing element is perforated to permit the synthetic material to penetrate in depth into this element so that the mechanical strength of the moulded object is increased.

In one particular embodiment, jute cloth is interposed between the reinforcing element and the retaining surface of the mounting members so as to increase the mechanical strength of the densified zone.

In order that the invention may be better understood, an embodiment thereof will now be described by way of example only and with reference to the accompanying drawing in which:—

Figure 1 is a diagrammatic sectional view of an object according to the invention; and

Figure 2 is a diagrammatic sectional view of a mould used for practising the method of the invention.

Referring to Figure 1, the object is made of a body 1 of moulded synthetic material in which is inserted a reinforcing element 2 of permeable elastically deformable material through which extend mounting members 3 for securing the object on a support. The body 1 may be formed from resilient material to form padding. In the example illustrated, the perimeter of the reinforcing element 2 is slightly smaller than that of the body 1, and the element is so positioned that only its upper face 4 lies flush with a face, i.e. the upper face, of body 1. The reinforcing element 2 comprises a sheet of synthetic foamed material having open cells into which the synthetic material making up the body 1 has penetrated at least superficially during its expansion, so that a relatively denser zone is created.

The reinforcing element 2 and the body 1 are solidly bonded together through zone 5. Furthermore, the reinforcing element acquires a great mechanical strength whereby it resists being pulled away.

The mounting members 3 each take the form of a rod, one end of which has an enlarged head providing a retaining surface 6 bearing against the inner face 7 of the reinforcing element 2. The other end of

each mounting member is formed with a hooked head 8 projecting from the moulded object. Since the retaining surfaces 6 bear against the denser zone 5 which surrounds the mounting members as they pass through the zone, a solid connection between the mounting members and the reinforcing element is ensured.

To produce the object illustrated in Figure 1, use is made of a mould consisting of a casing 9 (see Figure 2), in which is formed a cavity 10 for receiving the synthetic material to make up the body 1, and of a cover 11 having recessed holes 12 suitably distributed over that face of the cover presented to the cavity 10. The cross-section of each hole is slightly less than that of the hooked head 8 of the mounting member 3.

The mounting members 3 are introduced into a sheet of permeable elastically deformable material intended to form the reinforcing element 2, care being taken that the distribution of the members 3 corresponds to that of the recessed holes 12 in the cover 11 and that these members are pushed far enough into the porous material to ensure that the retaining surface 6 of each of them is in contact with the face 7 of the reinforcing element and that the hooked head 8 of each of them projects beyond the face of the reinforcing element.

Then, after the cover 11 has been so positioned that its recessed holes are accessible, the hooked heads 8 of the mounting members 3 are introduced into the holes by the application of pressure on the retaining surfaces 6, the thumb, for example, being used for this purpose. Since the cross-section of the recessed holes is slightly less than that of the hooked heads 8, the assembly formed by the reinforcing element 2 and the mounting members 3 is now firmly connected to the cover 11.

It should be pointed out here that the length of each mounting member is slightly less than the sum of the thickness of the reinforcing element 2 and the depth of the recessed hole in which the mounting member is inserted.

By pushing the hooked heads 8 right against the closed end of the recessed holes, as is possible because of the ability of the reinforcing element 2 to deform elastically, the element can be positioned firmly against the cover 11 and consequently the recessed holes are perfectly sealed. When the reinforcing element 2 has been secured to the cover 11, the synthetic material is then poured into the cavity 10 and the cover is closed.

During its expansion the synthetic material entirely fills the cavity 10 and adheres to the reinforcing element 2. Since the latter is made of an open-cell foamed material, the synthetic material penetrates into

these cells at least at the surface to form the zone 5 of relatively denser material which has the advantageous effect of increasing the mechanical strength of the reinforcing element so that it resists being pulled away, and of also strengthening the bond between the reinforcing element on the one hand and the synthetic material 1 and the mounting members 3 on the other.

Since the reinforcing element 2 is slightly compressed against the cover 11, thus forming a tight seal, the synthetic material 1 cannot reach the hooked heads of the mounting members, and these do not therefore have to be cleaned up at a later stage.

If it is required to increase the mechanical strength of the denser zone 5, a cloth of jute or any other textile material may be interposed between the retaining surface 6 of the mounting members and the inner face 7 of the reinforcing element. In the case where the reinforcing element 2 is perforated, the synthetic material making up the body penetrates to a greater depth into the element, and this again increases the mechanical strength of the moulded object.

Finally, when the polymerization of the synthetic material is completed, the object is removed from the mould and is ready to be secured to a support with which it is to co-operate and in which are formed, for example, perforations adapted to receive the hooked heads 8 of the mounting members 3.

The objects made as a result of the above described method find many uses, for example padding for seats, head-rests or interior facing parts in automobiles.

#### WHAT WE CLAIM IS:—

1. An object comprising a body of synthetic material, a reinforcing element of permeable elastically deformable material embedded in the body, the reinforcing element having a relatively denser zone formed by at least superficial penetration of the reinforcing element by the synthetic body material, and a plurality of mounting members extending through the reinforcing element, said mounting members each consisting of a rod, one end of which has a retaining surface adapted to bear on one face of the reinforcing element, and the other end of which projects from the object

and is provided with means whereby the object may be secured to a support.

2. An object according to claim 1 wherein the reinforcing element is made of an open-cell foamed material.

3. An object according to claim 1 or claim 2 wherein the reinforcing element is additionally perforated.

4. An object according to any of the preceding claims wherein said other end of each of the mounting members is provided with hooks which, in use, cooperate with a respective hole provided in the support.

5. An object according to any of the preceding claims wherein the body is made of resilient material.

6. An object according to any one of the preceding claims, wherein jute cloth is interposed between the reinforcing element and the retaining surface of each of the mounting members.

7. A method of moulding the object according to any one of claims 1—5 said method comprising introducing the mounting members into the reinforcing element so that the said other ends of the mounting members project therefrom, pressing the reinforcing element against the cover of a mould such that said other ends of said mounting members enter respective holes provided in the cover and are temporarily secured therein so that the reinforcing element is held tightly against the cover, pouring synthetic material into the mould, and closing the mould with said cover.

8. A method according to claim 7 wherein a jute cloth is interposed between the reinforcing member and the retaining surface of each of the mounting members.

9. An object substantially as hereinbefore described with reference to the accompanying drawing.

10. A method of moulding an object as claimed in claim 7, substantially as hereinbefore described.

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Fig. 2

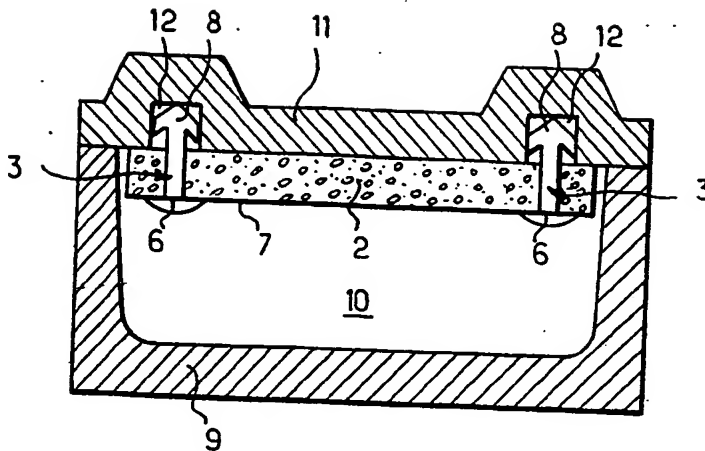


Fig. 1

